

## **AMENDMENTS TO THE CLAIMS**

The following listing of claims will replace all prior versions and listings of claims in the application.

### **LISTING OF CLAIMS**

1. (Currently Amended) A cooling system for cooling a friction device, comprising:

a flow control device that controls a flow of cooling fluid through said friction device; and

a controller that estimates a temperature state of said friction device based on an estimated heat rate of said friction device, calculates a cooling flow command based on said temperature state and operates said flow control device based on said flow command.

2. (Cancelled)

3. (Previously Presented) The cooling system of claim 1, wherein said controller determines a friction device torque and a friction device slip speed and calculates said heat rate of said friction device based on said friction device torque and said friction device slip speed signal.

4. (Previously Presented) The cooling system of claim 1, further comprising:  
a sump for collecting said flow of fluid; and  
a sump temperature sensor that generates a sump temperature signal, wherein  
said temperature state is further based on said sump temperature signal.
5. (Currently Amended) The cooling system of claim 1, wherein said  
temperature state is further based on a current cooling flow command.
6. (Currently Amended) The cooling system of claim 1, wherein said cooling  
flow command is further based on said heat rate of said friction device and a sump  
temperature of said flow of fluid.
7. (Original) The cooling system of claim 1, wherein said flow control device  
includes one of a fixed displacement pump, a variable displacement pump, an on/off  
valve and a variable opening valve.
8. (Original) The cooling system of claim 1, wherein said temperature state is a  
temperature of said friction device.
9. (Original) The cooling system of claim 1, wherein said temperature state is a  
thermal energy of said friction device.

10. (Currently Amended) A method of controlling cooling of a friction device, comprising:

estimating a temperature state of said friction device based on an estimated heat rate of said friction device;

calculating a cooling flow command based on said temperature state; and

controlling a cooling fluid flow through said friction device based on said cooling flow command.

11. (Cancelled)

12. (Previously Presented) The method of claim 10, wherein said heat rate is based on a friction device torque and a friction device slip speed.

13. (Previously Presented) The method of claim 10, further comprising measuring a temperature of said fluid flow, wherein said temperature state is further based on said temperature.

14. (Currently Amended) The method of claim 10, wherein said temperature state is further based on a current cooling flow command.

15. (Currently Amended) The method of claim 10, wherein said cooling flow command is further based on said heat rate of said friction device.

16. (Currently Amended) The method of claim 10, wherein said cooling flow command is further based on a temperature of said fluid flow.

17. (Currently Amended) The method of claim 10, wherein said step of controlling fluid flow comprises operating a flow control device based on said cooling flow command.

18. (Original) The cooling system of claim 10, wherein said temperature state is a temperature of said friction device.

19. (Original) The cooling system of claim 10, wherein said temperature state is a thermal energy of said friction device.

20. (Currently Amended) A method of controlling cooling of a friction device, comprising:

calculating a heat rate of said friction device;  
estimating a temperature state of said friction device based on said heat rate;  
determining a cooling flow command based on said temperature state; and  
operating a flow control device based on said cooling flow command to control a cooling fluid flow into said friction device.

21. (Original) The method of claim 20, further comprising:  
determining a friction device torque; and

determining a friction device slip speed, wherein said heat rate is based on said friction device torque and said friction device slip speed.

22. (Original) The method of claim 20, further comprising measuring a temperature of said fluid flow, wherein said temperature state is further based on said temperature.

23. (Currently Amended) The method of claim 20, wherein said temperature state is further based on a current cooling flow command.

24. (Currently Amended) The method of claim 20, wherein said cooling flow command is further based on said heat rate and a temperature of said fluid flow.

25. (Original) The method of claim 20, wherein said temperature state is a temperature of said friction device.

26. (Original) The method of claim 20, wherein said temperature state is a thermal energy of said friction device.

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)